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EXAMINER

PIERRE LOUIS, ANDRE

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DANIEL L. PLEASANT

Appeal 2008-004812
Application 10/783,645
Technology Center 2100

Decided¹: June 10, 2009

Before JOSEPH L. DIXON, ST. JOHN COURTENAY, III, and
STEPHEN C. SIU, *Administrative Patent Judges*.

SIU, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two month time period for filing an appeal or commencing a civil action, as recited in 37 CFR § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date.

STATEMENT OF THE CASE

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-16. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part.

The Invention

The disclosed invention relates generally to a model of a test system and running a statistically significant number of iterations on the model of the test system while varying uncertainty terms in a probability distribution (Spec. 2).

Independent claim 1 is illustrative:

1. A method of determining a measurement uncertainty of a test system comprising:
 - developing a test system model having a plurality of uncertainty terms;
 - entering the test system model into a simulator;
 - running a sufficient number of iterations of the test system model on the simulator while randomly varying each of a first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of results of a selected parameter; and
 - evaluating the results to determine a measurement uncertainty of the selected parameter.

The References

The Examiner relies upon the following references as evidence in support of the rejections:

Jamneala	US 6,804,807 B2	Oct. 12, 2004 (filed Feb. 28, 2003)
Panu Helisto, et al., <i>Measurement Uncertainty in the 1/f noise region: Zener voltage standards</i> , IEEE, 401-402 (2000) ("Helisto").		

Antonio Piratelli-Filho & Benedito Di Giacomo, *Uncertainty Evaluation in Small Angle Calibration Using ISO Gum Approach and Monte Carlo Method*, IMEKO World Congress Metrology in the 3rd Millenium June 22-27, 2003, Dubrovnik, Croatia (“Piratelli-Filho”).

The Rejections

1. The Examiner rejects claims 1-4 and 6-16 under 35 U.S.C. § 103(a) as being unpatentable over Jamneala and Piratelli-Filho.
2. The Examiner rejects claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Jamneala, Piratelli-Filho, and Helisto.

ISSUE #1

Appellant asserts that “there is no expectation of success in making the combination of the two teachings [of Jamneala and Piratelli-Filho]” (App. Br. 5) because, according to Appellant, “[t]here is no uncertainty in any of the models taught in Jamneala” (App. Br. 4) and “Piratelli-Filho. . . requires that the uncertainty terms be described by known probability distributions.” (App. Br. 5.)

Did Appellant demonstrate that the Examiner erred in finding that it would have been obvious to one of ordinary skill in the art to have combined the disclosures of Jamneala and Piratelli-Filho?

FINDINGS OF FACT

The following Findings of Facts (FF) are shown by a preponderance of the evidence.

1. Jamneala discloses that “[g]round-signal-ground (‘GSG’) probes are used to make radio-frequency (‘RF’) and microwave (‘MW’) measurements of electronic devices.” (col. 1, ll. 26-28.)
2. Jamneala discloses that a “GSG interface model can be thought of as existing at the interface between the calibrated GSG probe and a device under test (‘DUT’)” (col. 1, ll. 60-62).
3. Jamneala discloses “[i]n one embodiment, the GSG interface model includes a through path between a signal node and a signal source, a first inductance between a first ground node and a common ground, a second inductance between a second ground node and the common ground, and a mutual inductance between the first inductance and the second inductance.” (col. 1, l. 64 – col. 2, l. 3).
4. Jamneala discloses “a circuit model of an electronic device and a GSG interface model are entered into a simulator.” (col. 2, ll. 6-7.)
5. Jamneala discloses that “[a] simulation of the electronic circuit and GSG probe is run to obtain a simulated characteristic of the electronic circuit and GSG probe.” (col. 2, ll. 14-17.)
6. Jamneala discloses “simulated transmission characteristics (S_{12}) for the electronic device . . . having the corrections L_{corr} and M_{corr} . . .” (col. 6, ll. 41-45).
7. Jamneala discloses that “the values for . . . inductances were obtained by measuring the electronic device with calibrated ACPTM probes, and then iterating the simulation to obtain a best-fit between the simulated transmission characteristic and the measured transmission characteristic by varying the inductance values of the GSG interface model 50.” (col. 6, ll. 53-58.)

8. Jamneala discloses “[a] second plot 92 shows the transmission characteristic of the filter without the GSG interface model 50 included in the simulation.” (col. 6, ll. 58-61.)
9. Jamneala discloses that a “circuit model . . . [is] entered into an ADS simulator.” (col. 6, ll. 7-9.)
10. Jamneala discloses that “Fig. 1A shows . . . contact ground pads 24, 26 of the electronic device 28” (col. 3, ll. 51-57) and that “[t]he signal finger 18 contacts a signal pad 34 of the electronic device.” (col. 3, ll. 60-61.)
11. Piratelli-Filho discloses “determination of measurement uncertainty in calibration of small angle measurement instruments.” (Abstract.)
12. Piratelli-Filho discloses that “[o]ne of the requirements to attain ISO 9000 certification is that calibration results must be expressed in conjunction with the measurement uncertainty.” (page 1, col. 1.)
13. Piratelli-Filho discloses that “[t]he calibration of small angle measurement instruments . . . is a necessary effort to assure quality of the measurements” (page 1, col. 3).
14. Helisto discloses an example of a “measurement uncertainty” (abstract) as including “the noise in many measurements [that] can be described as $1/f$ noise limited by white noise at high frequencies.” (page 401, col. 1.)

PRINCIPLES OF LAW

Obviousness

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and

(3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007).

ANALYSIS (ISSUE #1)

Since Appellant’s arguments have treated claims 1-16 as a single group, which stand or fall together with respect to issue #1, we select independent claim 1 as the representative claim for this group with respect to issue #1. *See* 37 C.F.R. § 41.37(c)(1)(vii).

As described above, Jamneala discloses a “test system model” that includes a GSG probe and an electronic device (FF 1-4). The model is entered into a simulator (FF 4) and runs are performed iteratively (FF 7) by varying inductance values of the model (FF 7) to obtain a simulated transmission characteristic of the model (FF 5-6). Piratelli-Filho discloses calibration of instruments (FF 11) expressing the results with a “measurement uncertainty” (FF 12). We agree with the Examiner that it would have been obvious to one of ordinary skill in the art to iteratively perform simulation runs of a model of a device while varying parameters to obtain a range of model characteristics following the explicit disclosure of Jamneala, while expressing the distribution of results “in conjunction with the measurement uncertainty” following the explicit disclosure of Piratelli-Filho. Such a combination of known elements performing their known

function would have resulted in no more than an expected and predictable result of obtaining measurement results from an iterative test of a model and expressing the results using known statistical functions. “[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.” *KSR Int’l Co.*, 550 U.S. at 417 (citing *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282 (1976)).

In addition, according to Piratelli-Filho, one of ordinary skill in the art would have desired expressing results with “measurement uncertainty” for various reasons. For example, “calibration results must be expressed in conjunction with the measurement uncertainty” in order “to attain ISO 9000 certification” (FF 12). Also, calibrating devices “is a necessary effort to assure quality of the measurements” (FF 13).

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 1, and of claims 2-16 which fall therewith with respect to issue #1.

ISSUE #2

Appellant asserts that “Jamneala (or Piratelli-Filho) . . . [fails to disclose or suggest] any one of the three types of simulation engine[s] is utilized in the simulations.” (App. Br. 6.)

Did Appellant demonstrate that the Examiner erred in finding that Jamneala and Piratelli-Filho disclose or suggest a harmonic balance simulation engine, a time-domain simulation engine, or a linear S-parameter simulation engine?

ANALYSIS (ISSUE #2)

Jamneala discloses utilizing an ADS simulator (FF 9). The Examiner finds that the ADS simulator of Jamneala performs harmonic balance simulation, time-domain simulation, and linear S-parameter simulation (Ans. 4). Appellant agrees that “an ADS includes a harmonic balance simulation engine and may also include time-domain or linear S-parameter simulation engines” (App. Br. 6). Thus, it is undisputed that Jamneala discloses a simulator that includes a harmonic balance simulation engine, time-domain engine, and a linear S-parameter simulation engine. Given that the ADS simulator of Jamneala includes engines, as recited in claims 2, 3, and 4, we agree with the Examiner that it would at least have been obvious to one of ordinary skill in the art to perform functions and utilize engines that are present within the simulator disclosed by Jamneala.

Appellant argues that “the Examiner has not pointed to any such teaching in Jamneala . . . that any one of the three types of simulation engine is utilized in the simulations” (App. Br. 6). However, as described above, the Examiner finds, and Appellant agrees, that the ADS simulator of Jamneala contains the disputed simulation engines. If each of the disputed simulation engines is a component of the disclosed simulator, utilizing any of the engines would have entailed no more than common sense on the part of the skilled artisan and therefore the use of the components would have at least been obvious to one of ordinary skill in the art. Appellant has not provided a logical rationale to support Appellant’s contention that it would not have been obvious to one of ordinary skill in the art to utilize known components present in a known simulator being used to perform their known

functions to achieve an expected result of achieving a desired result from any of the known components.

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner's rejection of claims 2-4 with respect to issue #2.

ISSUE #3

Appellant asserts that "[t]he Examiner has not pointed to any specific teachings in either of the cited prior art references that disclose probing the DUT at a first frequency and measuring the results at a second frequency." (App. Br. 7.)

Did Appellant demonstrate that the Examiner erred in finding that Jamneala discloses or suggests providing a first frequency to the device under test and the results of the selected parameter are at a second frequency?

ANALYSIS (ISSUE #3)

The Examiner finds that "Jamneala et al does teach running a number of simulation iteration on the device to obtain simulation best-fit results (*see for example col. 6 lines 7-61 and col. 7 line 61- col. 8 line 23*), and that the simulation of Jamneala et al. is performed using wide range of different frequencies to produces [sic] these simulation results (*see simulation results of fig.2B-4*) (Ans. 10).

We agree with the Examiner that Jamneala discloses a range of input frequencies applied to a model (*i.e.*, “a first frequency”) as illustrated on the X-axes of Figs. 2B, 3A-C, and 4 of Jamneala. However, we do not find, and the Examiner has not demonstrated, that Jamneala also discloses a result of a selected parameter at a second frequency. The parameter values illustrated by the Y-axes in Figs 2B, 3A-C, and 4 of Jamneala (Fig. 2B, Y-axis – current through ground pads (col. 6, ll. 20-21); Figs. 3A-C, S_{12} ; and Fig. 4, S_{22}), which the Examiner presumably equates to the claimed “selected parameter,” do not appear to be associated with a frequency at all.

Accordingly, we conclude that Appellant has met the burden of showing that the Examiner erred in rejecting claim 8, and of claims 9 and 10, which depend from claim 8 with respect to issue #3.

ISSUE #4

Appellant asserts that “there is no mention of switches in the cited passages [of Jamneala]” (App. Br. 8).

The Examiner finds that “elements 24, 34, 26 of fig. 1 [of Jamneala] are substantially switches” (Ans. 10).

Did Appellant demonstrate that the Examiner erred in finding that Jamneala discloses or suggests a plurality of switches?

ANALYSIS (ISSUE #4)

As above, Jamneala discloses contact ground pads and a signal pad (FF 10), which the Examiner equates to “switches”. We disagree. The Examiner has not indicated a broad but reasonable definition of the term

“switch” that would encompass a contact ground pad or a signal pad. As such, we cannot agree with the Examiner that a contact ground pad or a signal pad is equivalent or suggestive of a “switch.”

Accordingly, we conclude that Appellant has met the burden of showing that the Examiner erred in rejecting claim 12 with respect to issue #4.

ISSUE #5

Appellant asserts that “there are no uncertainty terms”; that “no terms are randomly varied”; and that “no measurement uncertainties are determined by evaluation of a set of ‘second results’” in Jamneala (App. Br. 8). Appellant also argues that “Jamneala does a single set of simulations at one set of conditions to determine the uncertainties . . . [and] [t]here is no need to run the simulations at a second operating condition” (App. Br. 9).

Did Appellant demonstrate that the Examiner erred in finding that Jamneala and Piratelli-Filho discloses or suggests varying uncertainty terms and evaluating the results to determine a second measurement uncertainty of a selected parameter?

ANALYSIS (ISSUE #5)

As described above, Jamneala discloses entering model of an electronic device into a simulator and performing iterative runs while varying inductance values to obtain a simulated transmission characteristic of the model (FF 1-7). In addition, Jamneala discloses “[a] second simulation of the electronic circuit without the GSG interface model” (col. 8, ll. 14-16). Hence, Jamneala discloses varying uncertainty terms (*i.e.*,

varying inductance values in iterative runs) and determining a second measurement uncertainty (*i.e.*, determining a “second simulation” (FF 8)).

Appellant argues that “Jamneala does a single set of simulations at one set of conditions to determine the uncertainties . . . [and] [t]here is no need to run the simulations at a second operating condition” (App. Br. 9). We disagree with Appellant because Jamneala explicitly discloses a “second plot” that represents a second run under “a second operating condition” (*i.e.*, “without the GSG interface model” – *see, e.g.*, col. 6, l. 60). Given that Jamneala explicitly discloses a second run at a second operating condition, we cannot agree with Appellant that Jamneala supposedly does not disclose or suggest this feature.

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 13 with respect to issue #5.

ISSUE #6

Appellant asserts that Jamneala and Piratelli-Filho fails to disclose or suggest “the step of running includes running the simulation on a first simulation engine and then running the simulation on a second simulation engine.” (App. Br. 9.)

Did Appellant demonstrate that the Examiner erred in finding that Jamneala and Priatelli-Filho teach or suggest running iterations of a system model on a simulator using a second type of simulation engine?

ANALYSIS (ISSUE #6)

As described above, Jamneala discloses running the simulation at a first type of simulation engine (*i.e.*, containing the GSG interface model 50) and running an iteration of the model on a second simulation engine (*i.e.*, a simulation engine “without the GSG interface model 560 included in the simulation” – col. 6, ll. 60-61). Appellant does not provide a logical rationale supporting Appellant’s contention that Jamneala supposedly fails to disclose or suggest the disputed feature.

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 14 with respect to issue #6.

ISSUE #7

Appellant asserts that Jamneala and Piratelli-Filho fail to disclose or suggest “the existence, let alone the loading of any uncertainty terms associated with the GSG probe.” (App. Br. 9.)

Did Appellant demonstrate that the Examiner erred in finding that Jamneala and Piratelli-Filho disclose or suggest loading uncertainty terms associated with test system components into a simulator?

ANALYSIS (ISSUE #7)

As described above, Jamneala discloses running a simulation iteratively while “varying the inductance values of the GSG interface model” (col. 6, ll. 57-58). Hence, Jamneala discloses loading inductance values (*i.e.*, “uncertainty terms”) into the simulator. Appellant does not

indicate a definition of the term “uncertainty terms” and we do not find an explicit definition of the term in the Specification. In the absence of a definition of the term, we adopt a broad but reasonable construction of the term to include any factor or parameter that is not fixed (*i.e.*, “uncertain”). Because the inductance values of Jamneala are modified for each iteration of simulation, the inductance values are not fixed (*i.e.*, are “uncertain”). Thus, Jamneala’s inductance values constitute “uncertainty terms” as recited.

Given Jamneala’s explicit disclosure of loading inductance terms (*i.e.*, “uncertainty terms”) into the simulator, we cannot agree with Appellant’s contention that Jamneala supposedly fails to disclose or suggest loading such terms into a simulator.

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 15 with respect to issue #7.

ISSUE #8

Appellant asserts that Jamneala and Piratelli-Filho fail to teach or suggest “the automatic generation of system specifications” (App. Br. 9).

Did Appellant demonstrate that the Examiner erred in finding that Jamneala and Piratelli-Filho disclose or suggest automatically generating system specifications?

ANALYSIS (ISSUE #8)

As described above, Jamneala discloses iteratively running a simulation to obtain “simulated transmission characteristics . . . for the

electronic device” (col. 6, ll. 41-42). Appellant does not indicate, and we do not find an explicit definition of the term “system specifications” in the Specification. Under a broad but reasonable construction of the term to include any parameters or values that describe a system, we find that the results of simulation runs of Jamneala include parameters or values that describe the test system (*e.g.*, a GSG probe and/or electronic device), which include “simulated transmission characteristics” (*i.e.*, parameters or values that describe a system). While Appellant provides a general allegation that the Examiner erred in rejecting claim 16, Appellant provides no specific arguments to support the allegation.

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 16 with respect to issue #8.

ISSUE #9

Appellant asserts that “applying the teachings of Helisto to Jamneala would not provide the benefit suggested by the Examiner” (App. Br. 11); that “there would be no motivation to use any of the teachings of Helisto regarding 1/f noise in the system taught by Jamneala” (*id.*); and that “applying Helisto to the system of Jamneala would not be obvious.” (*Id.*)

Did Appellant demonstrate that the Examiner erred in finding that it would have been obvious to one of ordinary skill in the art to have combined the Jamneala and Helisto references?

ANALYSIS (ISSUE #9)

As previously described, Jamneala and Piratelli-Filho disclose a simulation of a model while varying uncertainty terms (*i.e.*, inductance values) to obtain output transmission characteristics that can be expressed “in conjunction with the measurement uncertainty” (Piratelli-Filho, page 1, col. 1). Helisto further discloses that measurement uncertainty includes “noise” (FF 14). We agree with the Examiner that it would have been at least obvious to one of ordinary skill in the art practicing Jamneala and Piratelli-Filho’s disclosure of obtaining and expressing output transmission characteristics in conjunction with measurement uncertainty to have included a noise term in the uncertainty terms, given the express disclosure of Helisto. If one of ordinary skill in the art generated transmission characteristics with measurement uncertainty (Jamneala and Piratelli-Filho) and measurement uncertainty terms include “noise terms” (Helisto), then it would have required no more than common sense on the part of the skilled artisan to have included a noise term in the uncertainty terms, since it was known to those of ordinary skill in the art that noise terms were, in fact, included in the uncertainty terms (Helisto). “[T]he common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not.” *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (citing *KSR Int’l Co.*, 550 U.S. at 413).

For at least the aforementioned reasons, we conclude that Appellant has not sustained the requisite burden on appeal in providing arguments or

evidence persuasive of error in the Examiner's rejection of claim 5 with respect to issue #9.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that Appellant has failed to demonstrate that the Examiner erred in:

1. finding that it would have been obvious to one of ordinary skill in the art to have combined the disclosures of Jamneala and Piratelli-Filho (issue #1);
2. finding that the combination of Jamneala and Piratelli-Filho discloses or suggests a harmonic balance simulation engine, a time-domain simulation engine, or a linear S-parameter simulation engine (issue #2);
3. finding that the combination of Jamneala and Piratelli-Filho discloses or suggests varying uncertainty terms and evaluating the results to determine a second measurement uncertainty of a selected parameter (issue #5);
4. finding that the combination of Jamneala and Piratelli-Filho teaches or suggests running iterations of a system model on a simulator using a second type of simulation engine (issue #6);
5. finding that the combination of Jamneala and Piratelli-Filho discloses or suggests loading uncertainty terms associated with test system components into a simulator (issue #7);
6. finding that the combination of Jamneala and Piratelli-Filho discloses or suggests automatically generating system specifications (issue #8); and

7. finding that it would have been obvious to one of ordinary skill in the art to have combined the Jamneala and Helisto references (issue #9).

However, Appellant has demonstrated that the Examiner erred in finding that Jamneala discloses or suggests providing a first frequency to the device under test and the results of the selected parameter are at a second frequency (issue #3) and finding that Jamneala discloses or suggests a plurality of switches (issue #4).

DECISION

We affirm the Examiner's decision rejecting claims 1-7, 11, and 13-16 under 35 U.S.C. § 103. We reverse the Examiner's decision rejecting claims 8-10 and 12 under 35 U.S.C. § 103.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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